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NATIONAL LIBRARY of MEDICINE NEWS

Published for institutions and individuals interested in health sciences communications.

Developing Strategies for Streamlining

The National Performance Review (NPR) and the President's initiative to reduce the size of government challenge agencies to develop a smaller yet responsive workforce that works better and costs less. These do not represent altogether new challenges for the National Library of Medicine. The Library continually seeks improved methods to accomplish the increasing demands for its programs and services with reduced staff, and to make its services even more responsive to to the nation's health information needs. Nevertheless, over the next several years the Library must reduce its staff, increase its supervisory ratio, reduce the number of positions in personnel, budget, information resource management, and grants and acquisitions, and modernize its information systems.

To provide leadership and coordination for the development of a streamlining plan that will enable the Library to meet the reduced staff ceilings and improve operations, NLM director **Donald A. B. Lindberg,** M.D., appointed a small working group co-chaired by the NLM deputy director, **Kent A. Smith,** and the associate director, Division of Library Operations, **Lois Ann Colaianni**. The group consisted of senior management and mid-level staff, and nonsupervisory employees.

Since January 1995, the group has heard reports from NLM associate directors who presented strategies for meeting the downsizing requirements in their program areas, and their associated streamlining activities. Streamlining suggestions from NLM employees identifying better ways to accomplish activities were also solicited and over 100 were received. All were reviewed by the working group and, where appropriate, were incorporated into the streamlining plan.

Some of these suggestions included establishing an active volunteer program, improving internal communications, implementing recommendations of the LO Working Group on Customer Service, and easing time demands of administrative tasks wherever possible. Reorganizations are also planned. Of the six major NLM components, three will be reorganized shortly. This includes the Divisions of Extramural Programs and Specialized Information Services, and the Office of Computer and Communications Systems. A more gradual reorganization is anticipated for the Division of Library Operations, which carries out fundamental library services and is NLM's largest component. All Offices and Divisions will institute streamlining initiatives. The streamlining working group discussions, the associate director reviews, individual task force efforts, and the NLM employee suggestions produced valuable recommendations for streamlining the organization that will enable the NLM to meet downsizing requirements without adversely affecting the Library's mission or current staff significantly. A System Reinvention Coordinating Committee, Executive Bureau, and working groups with representatives from all divisions of NLM are focusing on making the transition to new information systems as smooth as possible for both users and staff.

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NATIONAL LIBRARY of MEDICINE NEWS

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The Secretary of Health and Human Services has determined that the publication of this bimonthly periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through June 30, 1996.

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984, effective with Vol. 43, No. 6-7.

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NLM System Reinvention Initiative

In addition to downsizing the Federal workforce, the National Performance Review identified a set of recommendations to improve services to the public. Federal agencies were asked to establish reinvention labs to function as test sites for agency streamlining and deregulation. The NLM was identified as such a test site and is now involved in the NLM System Reinvention Initiative; an initiative that will redesign existing NLM computer systems to take advantage of new directions in software, hardware, and communications that now make it possible to provide new functions that will help users in ways not available under earlier circumstances. Its implementation will enhance services for NLM customers and permit the redirection of staff efforts from maintaining obsolete software to developing new improved services. A System Reinvention Coordinating Committee, Executive Bureau, and working groups with representatives from all divisions of NLM are focusing on making the transition to new information systems as smooth as possible for both users and staff.

Mr. **Joseph Hutchins** of the Office of Computer and Computer Systems chairs the project liaison group that deals with system development issues that cut across the major project areas. Mr. **Edward Sequeira** has recently been appointed as the reinvention project coordinator and will work in the Office of the Director, NLM, to assist in planning and overseeing the reinvention effort. □

"Making a Powerful Connection" Conference Report Available

The Library has announced the electronic availability of "Making a Powerful Connection: The Health of the Public and the National Information Infrastructure," a report of the U.S. Public Health Service Public Health Data Policy Coordinating Committee.

The report is the final version of a paper prepared for participants at an invitational conference held at NLM on April 19th (*News*, May-June 1995). In addition to describing the potential benefits to the public health community from increased use of the National Information Infrastructure, the paper discusses barriers that currently discourage application of NII technologies to the information needs of population-based public health and outlines a comprehensive strategy for realizing the poten-

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New Regents Appointed

Health and Human Services Secretary **Donna Shalala** has named two new members to 4-year appointments on the Library's Board of Regents: **Tenley E. Albright,** M.D., and **Sherrilynne Shirley Fuller,** Ph.D. The Board meets three times a year to review NLM programs and to formulate policy recommendations to the NLM director.

Dr. Albright, a general surgeon in private practice, is a graduate of Radcliffe College and Harvard Medical School. She has also received half a dozen honorary doctorates over her career. Dr. Albright has many professional affiliations, including membership on several committees of Harvard College and Harvard Medical School, the Board of Directors of the Whitehead Institute, the Woods Hole Oceanographic Institution, the New England Baptist Hospital, and the Friends of the National Library of Medicine. She has written extensively on subjects relating to cancer and about sports medicine. Dr. Albright won an Olympic Gold Medal in figure skating in 1956.

Dr. Sherrilynne Fuller is director of the Health Sciences Library and Information Center of the University of Washington in Seattle. That library serves as the Regional Medical Library for Region 6 of the National Network of Libraries of Medicine. Dr. Fuller received her undergraduate degree from Indiana University, an M.L.S. from the same school, and her doctorate in library and information management from the University of Southern California. Her career has included library positions at the Gulfport (Miss.) Memorial Hospital, public libraries in Anchorage and Colorado Springs, the University of Southern California, and the University of Minnesota. Dr. Fuller, who is a frequent contributor to the health sciences literature, has served NLM on the Biomedical Library Review Committee and on the outreach long range planning panel. □

Dr. Albright

Dr. Fuller

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tial of the NII to improve the health of the public. The conference was sponsored by NLM, the Office of the Assistant Secretary for Health, the Centers for Disease Control and Prevention, and the Agency for Health Care Policy and Research. The report was prepared by **Roz D. Lasker,** M.D., deputy assistant secretary for health (policy development), Office of the Assistant Secretary for Health; **Betsy Humphreys,** NLM assistant director for health services research information; and **William R. Braithwaite,** M.D., Ph.D., senior advisor for information policy, Office of the Assistant Secretary for Health.

The report is available on the Library's FTP (*nlmpubs.nlm.nih.gov*) and Gopher (*gopher.nlm.nih.gov*) servers in ASCII and WordPerfect formats:

- *URL: ftp://nlmpubs.nlm.nih.gov/nlminfo/newsletters/reports/niiph.txt*
- *ftp://nlmpubs.nlm.nih.gov/nlminfo/newsletters/reports/niiph.wp*
- *URL: gopher://gopher.nlm.nih.gov:70/00/nlminfo/newsletters/reports/niiph.txt*
- *gopher://gopher.nlm.nih.gov:70/99/nlminfo/newsletters/reports/niiph.wp* □

Dr. Ackerman Named NLM Assistant Director for HPCC

NLM director **Donald A.B. Lindberg,** M.D., has appointed **Michael J. Ackerman,** Ph.D., as NLM assistant director for High Performance Computing and Communications. Dr. Ackerman will continue in his role as head, High Performance Computing and Communications Office, within the Library's Lister Hill National Center for Biomedical Communications, and in his new capacity he will serve as the focal point within NLM for providing coordination, consultative, and advisory services relating to HPCC-funded activities.

Dr. Ackerman

In 1994 the Library announced a total of ten projects—involving 12 contracts totaling $26 million—as the first awards in health care to be made under the HPCC Program (*News,* March-April 1994). These projects fund health care applications such as testbed networks to share information resources, computerized patient records, and medical images; telemedicine projects to provide consultation and medical care to patients in rural areas; and advanced computer simulations of human anatomy for training via "virtual surgery." Detailed information about these ongoing projects is available from NLM's Public Information Office (e-mail: *publicinfo@nlm.nih.gov*).

Dr. Ackerman has been with NLM since 1987 when he was selected to head the newly created Educational Technology Branch within the Lister Hill Center. He has received a number of awards for his work as project coordinator for the highly successful Visible Human Project (*News,* November-December 1994), including a Public Health Service Special Recognition Award for "innovative direction of NLM's pioneering electronic imaging research project ... " □

New Exhibit on Medicine in India

The Library's History of Medicine Division will have a new exhibit opening in September, entitled "Allopaths, Maharajas, and Vaidyas; Nizams, Jams, and Hakims: Medical Pluralism in the Princely States of India." Drawing from material in the collections of **Kenneth X. Robbins,** M.D., and NLM, the exhibit will focus on medical practices and royal patronage in the hundreds of Indian states ruled by princes until the time of Indian and Pakistani independence. The exhibit examines the interaction and coexistence of Western allopathic and homeopathic medical systems with the indigenous Ayurvedic, Siddha, and Unani systems, along with other traditional and religious healing practices.

Indian princes under the Raj at the turn of the century, from the Robbins collection.

The exhibit will be on display in the main lobby of the National Library of Medicine (NIH Building 38), in Bethesda, Maryland from September 15 to December 31, 1995. For more information, contact:

Stephen Greenberg
History of Medicine Division
National Library of Medicine
Bethesda, MD 20894
Tel: 3014965405
INTERNET: hmdref@nlm.nih.gov

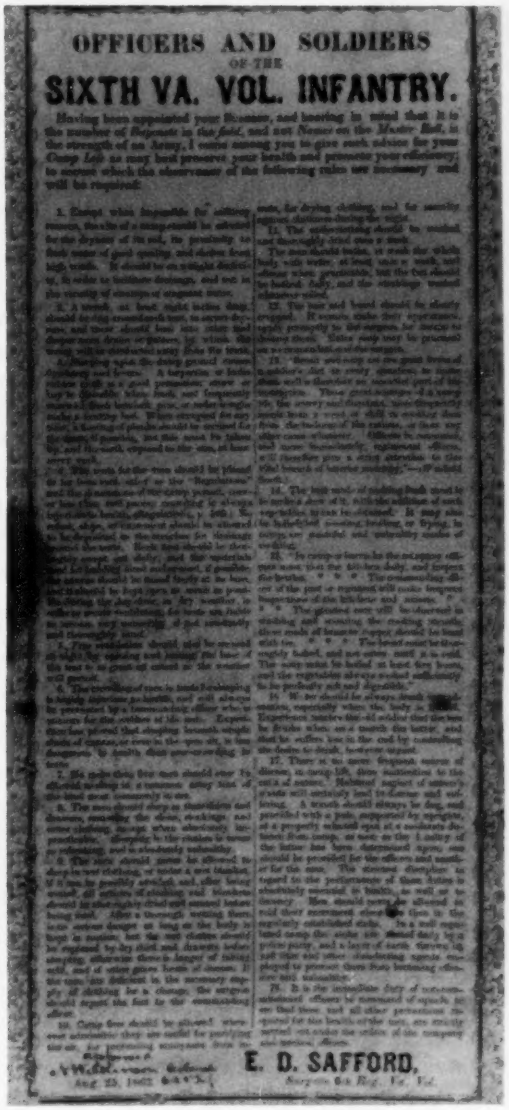
HMD Acquires Rare Civil War Broadside

The Library's History of Medicine Division recently obtained an extremely rare Civil War medical broadside issued by Erasmus D. Safford, the surgeon of the 6th Virginia Volunteer Infantry Regiments, United States of America, on August 25, 1862. (This regiment was renamed the 6th West Virginia Infantry Regiment when West Virginia became a state in 1863.)

The surgeon had the broadside printed and distributed to the men of his regiment as a set of public health and personal hygiene rules. As stated by Surgeon Safford, the purpose was "to give such advice for your Camp Life as may best preserve your health and promote your efficiency ... " The document also has the approval of Colonel Nathan Wilkinson, the commanding officer of the regiment.

This broadside clearly shows that many of the important principles of public health were known early in the Civil War. These included the need for good ventilation, prevention of crowding, personal cleanliness, toilet sinks in trenches at a distance from camps, and healthy diets. We now know that if these rules had been closely followed, the death rate from disease in the American Civil War would not have been twice that from wounds. □

This rare Civil War broadside will be displayed within the Division's exhibit of recent acquisitions through October 1995.



OFFICERS AND SOLDIERS
OF THE
SIXTH VA. VOL. INFANTRY.

Having been appointed your Surgeon, and bearing in mind that it is the number of Regiments in the field, and not Names on the Muster Roll, is the strength of an Army, I entre among you to give such advice for your Camp Life as may best preserve your health and promote your efficiency; to secure which the observance of the following rules are necessary and will be required:

E. D. SAFFORD,

NLM in Print

The following references cite works that discuss the products and services of the National Library of Medicine. If you know of other appropriate citations for this column, please send reprints or references to the editor, *NLM News,* National Library of Medicine, Bethesda, MD 20894. (*Note:* Some of the articles below may be from journals that are out of scope for the NLM collection and are therefore not available from the Library on interlibrary loan.)

Arndt KA, Dubin D. Peering at the dermatology literature. Arch Dermatol 1995 May;131(5):602-3.

Florance V. Computers in surgery: building the surgeon's virtual library. Contemp Surg 1995 Jul;47(1):40-4.

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A World of Knowledge for the Nation's Health
August 1995

UNIFIED MEDICAL LANGUAGE SYSTEM®

The purpose of the Unified Medical Language System® (UMLS®) is to help health professionals and researchers retrieve and integrate electronic biomedical information from a variety of sources. It will do this irrespective of the variations in the way similar concepts are expressed in different sources and despite the scattering of useful information among disparate computer systems.

The UMLS approach involves the development of machine-readable "Knowledge Sources" that can be used by a wide variety of applications programs to compensate for differences in the way concepts are expressed in different machine-readable sources and by different users, to identify the information sources most relevant to a user inquiry, and to negotiate the telecommunications and search procedures necessary to retrieve information from these sources. The goal is to make it easy for users to link information from patient record systems, bibliographic databases, factual databases, expert systems, etc. The UMLS Knowledge Services can also assist in data creation and indexing applications.

UMLS Development Strategy

A long-term project of the breadth and complexity of the UMLS requires the knowledge and skills of experts in many fields. For this reason the UMLS development strategy involves a combination of internal research and development at NLM itself, competitively awarded contracts for research assistance with several U.S. research groups, and advice from professional associations and other interested groups in the private sector. Research and development related to the UMLS is fundable under NLM's grant programs and under the National Science Foundation's Program in Database Activities in Biological, Behavioral, and Social Sciences, as well as special UMLS-related requests for contract proposals.

UMLS Components

There are now four UMLS knowledge sources: a Metathesaurus®, the SPECIALIST™ Lexicon, a Semantic Network and an Information Sources Map. The Metathesaurus provides a uniform integrated distribution format for more than 30 biomedical vocabularies and classifications. With a scope largely determined by its source vocabularies, the Metathesaurus contains information about biomedical concepts, their representation in different vocabularies and thesauri, and their use and co-occurrence in selected databases. The Metathesaurus represents a variety of relationships among terms and can support mapping from the user's terms to appropriate controlled vocabularies. The Lexicon contains syntactic information for many Metathesaurus terms, component words, and English words, including verbs, that do not appear in the Metathesaurus. The Semantic Network contains information about the types or categories (e.g., "Disease or Syndrome," "Virus") of terms in the Metathesaurus and the permissible relationships among these types (e.g., "Virus" causes "Disease or Syndrome"). The Information Sources Map or directory contains both human-readable and machine-"processable" information about the scope, location, vocabulary, syntax rules, and access conditions of biomedical databases of all kinds.

The UMLS knowledge sources are designed for use by system developers in a variety of biomedical and health-related environments. Although it will probably be necessary to create local addenda to support particular applications, the use of the central UMLS Knowledge Sources should substantially reduce the level of effort required to build effective user interfaces and data creation applications.

Programs making use of the UMLS Knowledge Sources should eventually be able to analyze user input; to select information sources likely to contain information relevant to user queries; to help refine user queries and translate them into the syntax suitable for searching relevant databases; and to merge, organize, evaluate, and rank the information retrieved according to its relevance to the user's query.

Multiple interface programs that make use of the UMLS Knowledge Sources are being developed, each tailored to the needs of particular groups of users or to specific hardware and software environments. NLM itself is using the UMLS Knowledge Sources in the Internet Grateful Med® interface to the MEDLARS® databases. Other interfaces that make use of the UMLS Knowledge Sources are being developed by other institutions and private companies.

Arrangements for Distributing UMLS Components

New editions of the UMLS are released annually.

NLM encourages broad experimentation with the UMLS Knowledge Sources. Those who wish to test the application of these tools in particular biomedical information environments are required to sign a one-year experimental agreement with NLM which may be extended when new experimental editions of the UMLS Knowledge Sources are issued. The general provisions of the agreement are as follows:

1. There is no charge for the UMLS products for the duration of the experimental agreement, although there may be a charge for subsequent versions of UMLS products.
2. Recipients of the UMLS products must provide feedback to NLM on how the products are being used and on any changes or enhancements that would make them more useful.
3. Recipients of the UMLS products may not redistribute them except as an integral part of the computer applications they develop.
4. Recipients of the UMLS products are responsible for complying with copyright restrictions that apply to some of the contents of the UMLS Metathesaurus.

Users of the experimental editions of the UMLS Knowledge Sources should be aware that there may be changes in the content or format of subsequent versions of the UMLS products.

Distribution Formats

The UMLS Knowledge Sources are available in multiple formats on six CD-ROMs, including an ASCII "relational" format, an Abstract Syntax Notation (ASN.1) format and, for the Metathesaurus, browsable versions usable on Apple Macintosh computers and on DOS-based PCs. Lexical programs useful in matching local vocabularies, free-text, or user queries to the Metathesaurus are also distributed on the CDs.

UMLS users may also access the complete UMLS files via an Internet Knowledge Source Server.

Application Procedures

Those interested in obtaining access to the UMLS products under the terms outlined above may obtain sample records, documentation, and copies of the experimental agreement from the NLM anonymous ftp file service at nlmpubs.nlm.nih.gov (UMLS files and documents are located in the /umls subdirectory) or write to:

Betsy L. Humphreys
UMLS Project Officer
National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894
FAX 301/496-4450

To obtain the complete versions of the UMLS Knowledge Sources, either on CD-ROM or via the Internet server, individuals or institutions must sign and return the experimental agreement.

Other facts sheets in the UMLS series:

(1) UMLS Semantic Network
(2) UMLS Metathesaurus
(3) UMLS Information Sources Map
(4) SPECIALIST™ Lexicon
(5) UMLS Knowledge Source Server

Copies are available on the ftp server or from:
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Email: publicinfo@nlm.nih.gov

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UMLS® METATHESAURUS®

The UMLS Metathesaurus is one of four knowledge sources currently under development by the National Library of Medicine as part of the Unified Medical Language System (UMLS) project. The Metathesaurus contains information about biomedical concepts and terms from a number of controlled vocabularies and classifications. It preserves the names, meanings, hierarchical contexts, and inter-term relationships present in its source vocabularies; adds certain basic information to each concept; and establishes new relationships between terms from different source vocabularies. The Metathesaurus supplies information that computer programs can use to interpret user inquiries, to interact with users to refine their questions, to identify which databases contain information relevant to particular inquiries, and to convert the users' terms into the vocabulary used by relevant information sources. The Metathesaurus is intended primarily for use by system developers, but should also be a useful reference tool for database builders, librarians, and other information professionals. The scope of the Metathesaurus is determined by the combined scope of its source vocabularies. The Metathesaurus is produced by automated processing of machine-readable versions of its source vocabularies, followed by human review and editing by subject experts.

The Metathesaurus is organized by concept or meaning. Alternate names for the same concept (synonyms, lexical variants, and translations) are linked together. Each Metathesaurus concept has attributes that help to define its meaning, e.g., the semantic type(s) or categories to which it belongs, its position in the hierarchical contexts from various source vocabularies, and, for many concepts, a definition. A number of relationships between different concepts are represented. Some of these relationships are derived from the source vocabularies; others are created during the construction of the Metathesaurus. Most inter-concept relationships in the Metathesaurus link concepts that are similar along some dimension. The Metathesaurus also includes use information, including the names of selected databases in which the concept appears, and, for MeSH® terms, information about the qualifiers that have been applied to the terms in MEDLINE®. Information on the co-occurrence of concepts in MEDLINE and in AI RHEUM is also included.

Content of the 1995 Metathesaurus

The 1995 version of the Metathesaurus contains 222,927 concepts named by 478,562 biomedical terms from thirty one source vocabularies. It contains all terms from the 1995 MeSH, NLM's Medical Subject Headings; DSM-IIIR and DSM-IV, the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Third edition (revised) and Fourth editions; the Classification of Nursing Diagnoses; the Home Health Care Classification of Nursing Diagnoses and Interventions; the Nursing Interventions Classification, and the Omaha System: Applications for Community Health Nursing; UMDNS, ECRI's Universal Medical Device Nomenclature System; AI Rheum, the NLM Rheumatology expert system; and WHOART, the WHO's adverse drug reaction terminology. It contains all preferred terms from COSTART, the FDA's Thesaurus of adverse reaction terms; all preferred names of diseases and procedures from ICD-9-CM, the International Classification of Diseases, 9th edition, Clinical Modification; and all procedures and topography terms from the 1993 SNOMED International. It contains selected terms from other vocabularies, including LCSH, the Library of Congress Subject Headings; CRISP, the USPHS Thesaurus for indexing scientific projects; DxPLAIN, Massachusetts General Hospital's expert diagnostic system; PsycInfo, the APA's Thesaurus of Psychological Index Terms; OMIM, Online Mendelian Inheritance in Man; and a set of clinical terms frequently used at three COSTAR sites. The statistical profile is as follows:

53,842	MeSH (17,757 preferred terms)
151,036	MeSH supplementary chemical terms.
46,267	SNOMED International (34,896 preferred terms)
30,409	ICD-9-CM terms (16,849 preferred terms)
24,713	INSERM French translation of MeSH (Main headings and Synonyms)
17,606	Spanish translation of MeSH Main Headings
17,606	Portuguese translation of MeSH Main Headings
15,256	SNOMED II (8,820 preferred terms)
10,113	DXPlain (6,547 preferred terms)
7,704	UMDNS (4,531 preferred terms)
6,454	CRISP (6,454 preferred terms)
5,521	LCSH (5,521 preferred terms)
5,386	COSTART (1,182 preferred terms)
4,319	PsycInfo (3,079 preferred terms)
3,293	WHOART (1,292 preferred terms)
2,068	COSTAR (2,068 preferred terms)
972	NIC (359 preferred terms)
684	AI Rheum (557 preferred terms)
604	Neuronames (604 preferred terms)
557	CPT (210 preferred terms)
539	OMS (422 preferred terms)
467	DSM 3R (267 preferred terms)
448	PDQ (88 preferred terms)
333	HHC (306 preferred terms)
135	NANDA (127 preferred terms)
122	ACR (122 preferred terms)

Distribution Formats

The complete 1995 Metathesaurus is distributed on CD-ROM, in combination with the other UMLS Knowledge Sources. Six discs are provided: Two ISO 9660 discs containing the Knowledge Sources in ASCII Relational format data and two containing the Knowledge Sources in ASN.1 format; one disc with Macintosh HFS browsers; and one with the DOS Coach Browser.

The CD-ROM files are are distribution formats, containing all Metathesaurus data elements and totaling more than 753 megabytes. Developers can select data elements and choose data representations to meet their own needs. Local hardware and software requirements will be determined by the number and types of elements chosen, by the data representation selected, and by the performance characteristics desired. Any machine equipped to read ISO 9660 CD-ROM discs will be able to access these files.

The only Metathesaurus applications programs distributed are the Coach and MetaCard browsers. A Semantic Net Browser and C source code for Lexical programs are included (see the Semantic Net and Specialist Lexicon Fact sheets).

The DOS Coach Metathesaurus Browser, developed in NLM's Lister Hill Center, is distributed on CD-ROM. It requires a CD-ROM drive, DOS 4.0 or later, 640Kb of RAM, and a color monitor. It may be installed on a Novell network.

The Apple Macintosh MetaCard Browser is a HyperCard application developed by Lexical Technology, Inc. and distributed on an HFS CD-ROM. MetaCard requires a Macintosh SE computer (or later model); a CD-ROM drive; HyperCard 2.1 Player; and 3 megabytes or more of memory.

UMLS users may also access the complete UMLS files via an Internet Knowledge Source Server.

Application Procedures

Those who wish to obtain copies of UMLS products are required to sign a one-year experimental agreement with the NLM. Sample records, documentation, and copies of the experimental agreement, are available from the NLM anonymous ftp file service at nlmpubs.nlm.nih.gov (UMLS files and documents are located in the /umls directory) or write to:

Betsy L. Humphreys
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Other Fact Sheets in the UMLS series:

(1) Unified Medical Language System
(2) UMLS Semantic Network
(3) UMLS Information Sources Map
(4) SPECIALIST Lexicon
(5) UMLS Knowledge Source Server

Copies are available from the ftp file service or from:

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Opportunities for Training and Education Sponsored by the National Library of Medicine

The National Library of Medicine supports a variety of education and training opportunities for health professionals. The subjects include medical informatics, biotechnology, online information access, and medical librarianship. Brief descriptions follow. For more information, please get in touch with the person or office listed.

Medical Informatics

Institutional Grants

The Library supports training grants in medical informatics at 10 major universities. They are intended to train predoctoral and postdoctoral students for research in medical informatics. Some offer special track training in such informatics-intensive fields as radiation oncology and biotechnology. A description of the 10 programs, with their fields of emphasis, is available from Roger Dahlen, Ph.D., Extramural Programs, National Library of Medicine (301-496-4221).

Individual Fellowships

Informatics Research Training. Post-doctoral health science workers who identify a mentor, institution, research project, and curriculum are eligible to compete for individual fellowships in informatics. These fellowships complement the institutional programs (described above) by making it possible for students to enter into informatics training at any institution with appropriate mentor and facilities. Details are available from Roger Dahlen, Ph.D. (301-496-4221), dahlen@lhc.nlm.nih.gov

Applied Informatics. These fellowships support training for those who will design or manage large information systems, or adapt applications developed by research workers to actual use in a clinic setting, classroom, laboratory, library, or office. Although many applicants will have doctorates, nurses, librarians, and other health professionals without doctoral degrees are encouraged to apply. Details are available from Roger Dahlen, Ph.D. (301-496-4221).

IAIMS

Over the last decade, NLM has supported the development of Integrated Academic Information Management Systems in selected major medical centers. The enormous experience gained by those who, through on-the-job training, have developed and implemented extremely complex integrated information systems, will now be systematically exploited through designated training slots at IAIMS sites. Details are available from Mr. Richard West, Extramural Programs, National Library of Medicine (301-496-3113).

Biotechnology

The Library's National Center for Biotechnology Information conducts a Scientific Visitors Program to provide support for faculty members, postdoctoral, and other scientists for periodic recurring visits ranging from a few days to several weeks, or for continuous assignments up to several months. Details are available from Barbara Rapp, Ph.D., National Center for Biotechnology Information, National Library of Medicine (301-496-2475).

For recent doctoral graduates, the National Research Council Research Associateship Program provides an opportunity for concentrated research in association with selected members of the NCBI scientific staff. Details are available from David Lipman, M.D., National Center for Biotechnology Information, National Library of Medicine (301-496-2475).

Undergraduate Research Study Program (URSP)

The Library's Lister Hill National Center for Biomedical Communications has created the URSP as a way of linking the Center's interest in digital image processing and communications systems with the professions of electrical engineering and computer science. Students majoring in these fields are selected from historically black colleges and universities and awarded 2-year scholarships and enrolled in two summer internships at

the NLM. Details are available from Mr. Earl Henderson, Lister Hill Center, National Library of Medicine (301-496-4441).

Woods Hole

The Marine Biological Laboratory at Woods Hole, Massachusetts, will conduct an NLM-sponsored 1-week course in medical informatics in June 1995. Some 30 trainees will be selected from among applicants in the health professions, research, and librarianship. They receive intensive hands-on experience with a variety of medical information systems, including Grateful Med®, medical informatics, expert systems, and molecular biology databases. Those selected have most costs covered. For more information, write to Ms. Catherine N. Norton, Director of Information Systems, Marine Biological Laboratory, Woods Hole, MA 02543 (508-548-3705 x341).

The Learning Center for Interactive Technology (TLC)

The TLC is a hands-on laboratory where visiting scientists and educators can explore and compare various uses of interactive computer-based educational and information technologies for the health professions. The TLC includes programs available on optical discs (videodisc, CDROM, PhotoCD and CD-I), and programs accessible over local area networks and over the Internet. Individual and small group demonstrations and tutorials are offered. Details are available from Michael Weisberg, ED.D., Lister Hill National Center for Biomedical Communications, National Library of Medicine (301) 496-6280.

HBCU Toxicology Information Outreach

The Library's Toxicology Information Program is supporting projects designed to strengthen the capacity of Historically Black Colleges and Universities (HBCUs) to train medical and other health professionals in the use of toxicological, environmental, occupational and hazardous wastes information resources developed at NLM. A number of HBCUs with schools of medicine, pharmacy and nursing are participating in the program which includes training, the provision of PC-based workstations, and free access to NLM's on-line databases. Details are available from Melvin Spann, Ph.D., Toxicology Information Program, National Library of Medicine (301-496-1131).

NIH Medical Informatics Elective

The Computer Science Branch of the Lister Hill Center conducts an 8-week elective in Medical Informatics, as part of the NIH Clinical Electives Program. Each spring this elective combines an extensive seminar series by senior figures in the field with an independent research project under the preceptorship of an NIH professional. Eight to 14 third-year and fourth-year medical students are admitted each year. Details are available from Lawrence Kingsland, Ph.D. Lister Hill Center (301-496-9300).

Online Information Access

At NLM

A 3-day training course, "Fundamentals of MEDLARS® Searching," is held periodically at the NLM in Bethesda, Maryland. Eight specialized modules, ranging from half-day to 2 days, are also available covering specialized NLM databases. These classes are for U.S. domestic Medlars code-holders. There are no fees for the training, but students must cover their own travel and living expenses. Details are available from Ms. Janet Zipser, MEDLARS Management Section, National Library of Medicine (301-402-1076).

In the Regions

MEDLARS. Three Regional Medical Libraries also conduct online training and offer many of the same basic and specialized training courses offered at NLM. There may be fees involved for the specialized courses in the regions. To be put in touch with the Regional Medical Library serving your area, call 1-800-338-7657.

Grateful Med. Some hospital and other health science libraries offer Grateful Med training courses as part of outreach subcontracts and special agreements with the Regional Medical Libraries. More information is available by contacting your Regional Medical Library at 1-800-338-7657.

Library/Information Science Training

Library Associate Program

Each year the NLM offers a one-year postgraduate training program to four recent graduates of an ALA-accredited library school who wish to spend a year in training at the NLM. There is also an additional slot for a librarian from abroad. By exposing the trainees to the concepts and skills required in running a modern biomedical library, NLM hopes to prepare the trainees for future leadership roles in librarianship and information science. More information is available from Martha Fishel, Public Services Division, National Library of Medicine (301-496-5501).

Indexing

The NLM periodically offers a 2-week training program for those who are preparing to index biomedical journals for MEDLARS. Trainees are chosen from NLM staff, those who work for NLM's contractors, and those who will become indexers at non-U.S. MEDLARS Centers. The training is followed by an extensive apprenticeship in indexing under the guidance of senior indexers. More information is available from Beth Van Lenten, Ph.D., Indexing Section, Bibliographic Services Division, National Library of Medicine (301-496-6766).

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